

I CLAIM

1. An irradiation apparatus comprising:

a NEMA 4 watertight housing that forms an enclosure and
which has a floor in which an irradiation window opening is defined,

5 a quartz window disposed across said window opening in
watertight sealed engagement therewith,

a microwave excited ultraviolet radiation generator that includes
an electrodeless lamp that produces ultraviolet radiation positioned within said
watertight housing proximate said window opening to emit said ultraviolet radiation
10 through said quartz window to an area at the exterior of said housing beneath said
quartz window,

an air inlet duct to said housing for directing cooling air toward
said electrodeless lamp, and

an air outlet duct from said housing for withdrawing from said
housing air that has passed said electrodeless lamp.

2. An irradiation apparatus according to Claim 1 further comprising a baffle
located within said watertight housing and positioned in the path of said air inlet duct to
aid in deflecting air from said air inlet duct toward said electrodeless lamp and on to
said air outlet duct.

3. An irradiation apparatus according to Claim 3 further characterized in

that said baffle has perforations defined therethrough.

4. An irradiation apparatus according to Claim 1 wherein said floor of said watertight housing is formed of stainless steel and said watertight housing is further comprised of laterally enclosing upright stainless steel walls extending up from said floor and a stainless steel lid to which said air inlet and air outlet ducts are joined.

5. Apparatus for irradiating packaging materials to neutralize harmful bacteria comprising:

a NEMA 4 waterproof housing that forms an enclosure and which has a floor in which an irradiation window opening is defined,

a quartz window disposed across said window opening in watertight, sealed engagement therewith,

a microwave excited ultraviolet radiation generator that includes an electrodeless lamp that produces ultraviolet radiation positioned within said watertight housing proximate said window opening to emit said ultraviolet radiation through said quartz window to packaging materials located outside said housing beneath said quartz window,

an air inlet duct to said housing for directing cooling air toward said electrodeless lamp, and

an air outlet duct from said housing for withdrawing from said housing air that has passed said electrodeless lamp.

6. An apparatus according to Claim 5 further comprising a deflecting baffle located within said watertight housing aligned with the path of air flow through said air inlet duct, whereby said baffle aids in deflecting air from said air inlet duct toward said electrodeless lamp.

7. An apparatus according to Claim 6 wherein said baffle has perforations defined therethrough.

8. An apparatus according to Claim 5 in which said floor of said watertight housing is formed of stainless steel and said housing is further comprised of upright stainless steel walls surrounding said ultraviolet radiation generator and a removable stainless steel lid located atop said upright walls, and said air inlet and said air outlet ducts are joined to said stainless steel lid in perpendicular orientation relative to said floor, and said housing is further comprised of a compressible, watertight gasket interposed between said removable lid and said upright walls to maintain a watertight seal therebetween.

9. A method of irradiating articles of packaging to neutralize harmful bacteria utilizing irradiation apparatus that includes:

a NEMA 4 watertight housing that forms an enclosure and which has a floor in which an irradiation window opening is defined,

a quartz window disposed across said window opening in watertight sealed engagement therewith,

10 a microwave excited ultraviolet radiation generator that includes
an electrodeless lamp that produces ultraviolet radiation positioned within said
watertight housing proximate said window opening to emit said ultraviolet radiation
through said quartz window to an irradiation treatment area at the exterior of said
housing beneath said quartz window,

an air inlet duct to said housing, and

an air outlet duct from said housing, the steps comprising:

15 conveying food packaging through said irradiation
treatment area, and

concurrently providing power to said electrodeless lamp to
irradiate said food packaging to neutralize harmful bacteria thereon.

10. A method according to Claim 9 further comprising directing cooling air
toward said electrodeless lamp.

11. A method according to Claim 10 further comprising withdrawing from
said housing air that has passed said electrodeless lamp.